Final Report for Section 309 – Cumulative and Secondary Impacts

Task 2 – Model Septic System Maintenance Program

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Table of Contents

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Introduction

In South Carolina, as in many states, current regulations for onsite wastewater disposal systems (OSDS, also called septic systems) do not require routine inspections or maintenance of operating systems. The additional staffing levels that would be needed to adopt and implement such regulations make a mandated operation and maintenance program at the state level unfeasible at this time. However, this does not lessen the need for coast-wide implementation of operation and maintenance of OSDS.

Many of the soils in coastal South Carolina, particularly those in proximity to environmentally sensitive coastal waters, can be characterized as having high seasonal water tables and high permeability rates. In addition, state regulations require only a minimum six-inch separation distance between the drainfield trench bottom and the seasonal high water table. Thus these soils do not inherently provide a high degree of purification or treatment of wastewater. These soils are also under increasing development pressure as the population boom continues along coastal South Carolina. The SC DHEC Onsite Wastewater Management Branch uses modified OSDS designs to maximize the separation distance between the trench bottom and the seasonal high water table. However, many thousands of OSDS are still in use that were designed and installed under older (or no) regulations and site evaluation methods. These older systems in particular present a high risk for contamination of coastal waters, especially if not maintained. This, combined with increased development pressures on marginal soils contributes to the potential for cumulative and secondary impacts to coastal waters from septic systems.

Objectives

The main objective of this task was to assess the feasibility of developing and implementing a model OSDS maintenance program for a local community in the coastal zone. Based on the successful development and implementation of a model program, it was anticipated that more local communities would be interested in following suit. Another objective was to increase public awareness of OSDS operation and maintenance so that failure rates of systems would be decreased.

Products and Program Status

The tasks that were set forth to meet these objectives and the products of those tasks are as follows:

1. Conduct literature review and compile information to present to local communities. The enclosed *Onsite Wastewater Treatment Management Options – A Guide for South Carolina Communities* (Attachment 1) was researched and assembled for distribution to local communities. The primary sources of

information were from the National Small Flows Clearinghouse (NSFC) and from Internet searches on existing maintenance programs nationwide. Additional information on OSDS management options also was made available to interested communities. Overall, the number of existing OSDS management programs and/or ordinances found nationwide during the searches was very small.

2. Identify a local community willing to be a pilot site. In June of 1998, letters were sent to all 50 coastal zone mayors inviting their participation in the pilot project to develop and implement a model septic system maintenance program (Attachment 2). The above *Guide* was included in the mailing along with the OSDS facts sheets and record-keeping folder developed by OCRM for an earlier §308 project. Following a positive response from several communities, another letter and a questionnaire was sent that requested information regarding the community's willingness and ability to commit staff and resources toward the development of a pilot program (Attachment 3). The City of Folly Beach, located in Charleston County, submitted an excellent proposal (Attachment 4) that outlined a test area (see map, Attachment 5) and was chosen for the pilot program (Attachment 6).

3. Assist in the development of a local ordinance where feasible. A steering committee was established with members representing OCRM, the local DHEC Environmental Health OWMB, City of Folly Beach staff, City Council, the Planning Commission, and a local realty company that sells and manages numerous vacation properties. The steering committee met numerous times throughout the entire project. The eight-member committee originally envisioned a mandatory pilot program for all 150 properties located within the test area. However, after verbal and written input from the public during the first Neighborhood Meeting in March of 1999 (Attachments 7 & 8), the mayor decided to make the pilot program voluntary. Therefore, the steering committee decided that the development and adoption of an ordinance would be addressed at the conclusion of the pilot program. The local newspaper printed an article on the public meeting and on the goals of the pilot program (Attachment 9).

4. Develop a program to monitor the success of the ordinance. *This task was changed to: development and implementation of the pilot inspection and maintenance program.* Funding for the pilot program was procured through OCRM, and Folly Beach was asked to submit a grant proposal (Attachment 10). As the proposal stated, a survey was mailed to all of the test area residents. Since the initial response was slow, the city switched to conducting telephone surveys, which proved to be the best method for gathering information. The Grant Agreement between DHEC and Folly Beach laid out the scope of the pilot program and provided $10,000 in grant money that was matched by the city (Attachment 11). A description of the pilot program was included in OCRM's web site (Attachment 12). The city advertised for a company to bid on the inspection program, received two bids and drafted a letter of agreement (Attachment 13).

The city also addressed the issue of septage disposal (Attachment 14). The chosen contractor for the inspections, Nature's Calling, received septic tank and drainfield inspection training from DHEC in August 1999.

5. Assist in public meetings and workshops to implement program. Following the inspection training for the contractor a public workshop was held. Although well publicized, including a direct mailing to all of the participants in the test area, only a small number of residents attended; however, their responses were overall positive (Attachment 15). It was then decided that any city resident could apply for participation in the pilot program. In addition to describing the pilot program, the workshop was aimed at educating the participants on the basics of OSDS operation and maintenance (see sample slides, Attachment 16). The public was also kept informed by the local newspaper (Attachment 17).

6. Begin monitoring the program. Because the number of voluntary program participants was so small (around 40), the $145 cost for each inspection was covered in full by the grant. Due to the threat of several hurricanes during the fall of 1999, the inspection program got off to a slow start (Nature's Calling primarily provides and services portable toilets, and their demand is apparently high during such events). Because this was the first time such an endeavor had taken place at the private/local level in South Carolina, the inspection process was very much a team effort. The local OWMB staff provided copies of all available permits. The city Public Works Department provided maps and the employees located and uncovered the septic tanks for the inspections taking place in a particular day in advance of the contractor's arrival. The inspections were supervised and assisted by the OCRM project manager and OWMB staff, and by the Folly Beach Director of Public Works. An inspection form, developed by OCRM and OWMB staff, was completed for each site (Attachment 18). Each inspection was also documented via digital videotape by the city and camera by OCRM. Almost every septic tank was pumped out, unless the scum and sludge levels were so minor that essentially only liquid was in the tank. The septage was disposed of at the Plum Island Wastewater Treatment Plant.

   After all the inspections were completed, a meeting was held to rank the results into categories of high (A), medium (B), and low (C) for purposes of prioritizing repairs and upgrades (Attachment 19). The seven A-ranked systems were considered to be in need of total system upgrades. These systems ranged from homemade, brick, bottomless septic tanks to drainfields located under housing additions. Many of the A- and B-ranked systems had broken or missing inlet and outlet tees and many had cracked lids and sometimes cracked tanks. The main problems, if any, associated with the C-ranked systems were related to missing protective barriers. A couple of the systems could not be inspected because the tanks were not accessible. Each homeowner received a letter that discussed the inspection findings and any recommendations and included a copy of the inspection report. A follow-up newspaper article was fairly accurate in summarizing the overall results of the inspection program (Attachment 20).

The City of Folly Beach then proceeded with the repair phase of the program. A Request for Proposals (Attachment 21) for estimates on the upgrades of the seven A-ranked systems was sent to several companies. Once all of the bids were received, sufficient funds from the grant were available to pay for 2/3 of the costs for only four of the seven systems. Letters were sent to the interested homeowners with a Memorandum of Agreement regarding the upgrades and payment arrangements for their 1/3 share of the cost (Attachment 22). The proposed upgrades were designed by OWMB staff and discussed with the homeowners (Attachment 23). OWMB staff also conducted final installation inspections. In addition, post-installation inspections were done by OCRM to see if permanent barricades had been installed to protect the new systems (Attachment 24). Letters were sent to the two homes still in need of effective barricades (Attachment 25).

In June of 2000, Folly Beach submitted documentation of their expenditures to comply with the match requirements of the grant (Attachment 26). The city more than met the $10,000 match. This was evidence of the city's enthusiasm for the project and their willingness to put every effort into making the pilot program a success.

7. Prepare interim report on establishment of ordinance. The City of Folly Beach is very interested in developing an ordinance based on the results of the pilot program. They are in the process of developing a final report (to augment this interim report) that tabulates and summarizes the surveys conducted earlier in the program. This report will provide valuable information regarding the homeowners knowledge about their septic systems, and about their attitudes toward having a maintenance program run by the city. Although the grant agreement expired in March, the steering committee has continued to meet to discuss development of the ordinance (Attachment 27). A presentation to City Council regarding the findings of the pilot program and the development of an ordinance is planned for late September 2000.

8. Prepare final report on success of ordinance. A final report on the development and adoption of an OSDS maintenance ordinance for the City of Folly Beach will be submitted with the next OCRM annual report.

Folly Beach Septic System Inspection Pilot Program
Summary Results, January 2000

SITE #	1999 INSP DATE	INLET TEE	OUTL. TEE	NOTE PROBLEMS	REPAIRS NEEDED	ESTIM. REPAIR COST	PRIORITY RANKING
1	12/15	OK	OK	* drainfield is under driveway & is compacted; * liquid leaked in tank from house & drainfield; * washing machine drains to two 5-gal buckets buried in back yard next to marsh; * tank lid broken and tank concrete deteriorating	* replace entire drainfield, possibly in right of way; * install new tank	$1,525	A
2	12/7	BAD	BAD	* liquid leaks from drainfield into tank; * lid broken; * sand in tank; * tank not watertight and tees broken or missing; * protective barriers not effective; * separate grey water discharge	* repair or replace tees, lid; * seal tank or replace; * put protective barriers in; * grey water discharge and drainfield upgrade	$1,325	A
3	12/9	BAD	BAD	* not clear if tank is watertight; * busted lid in tank; * tees broken or missing * boats parked on drainfield - may be compacted; * liquid level over bottom of outlet - drainfield clogged or saturated	* replace tees and possibly tank; * may need new tile line * install protective barriers	$1,300	A
4	10/27	BAD	BAD	* old brick tank has no bottom; * lid is wooden, broken & dangerous; * drainfield in neighbor's yard; * greasepit under small deck; * washing machine goes to seepage pit	* upgrade entire system	$1,925	A
5	11/17	BAD	OK	* tank overflowing down hill; * drainfield very shallow saturated, has had surface discharge; * house addition built over tile line	inlet tee; new drainfield	$1,325	A
6	12/7	BAD	BAD on one	* 3 tanks located: * #1: small; set in concrete patio; allows rain in; inlet tee broken; * #2: ground water seeps in crack from tree; * #3: liquid gushed from drainfield in tank; lid broken & dangerous; drainfield small & wet	* replace entire system, especially on west side	$1,300	A

Priority Ranking for replacement or repairs
A= highest priority
B= medium priority
C= lowest priority

DATA FROM SCDHEC-OCRM

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SITE #	1999 INSP DATE	INLET TEE	OUTL. TEE	NOTE PROBLEMS	REPAIRS NEEDED	ESTIM. REPAIR COST	PRIORITY RANKING
7	10/27	?	?	* tank lid partially covered by house - inaccessible & has hole in it; * not pumped	* install new tank and drainfield bed	$1,425	A
8	10/26	BAD	BAD	liquid operating level above bottom of outlet pipe; water trickled in from house; drainfield may not be operating properly	replace tees; check for leaky toilet and repair maintain system according to enclosed Homeowner's Guide		B
9	11/17		?	no protective barriers, evidence of traffic on drainfield; no liquid in tank - low water use and cracked from trees; roots in tank	replace tank or seal to make watertight; put barriers around drainfield; maintain system according to enclosed Homeowner's Guide		B
10	10/27	OK	?	water trickled in from house; tank settled unlevel; deck built over drainfield	check for leaky toilet and repair; maintain system according to enclosed Homeowner's Guide		B
11	10/27	CK	?	water trickled in from house; outlet end of tank is under walkway;	check for leaky toilet and repair; maintain system according to enclosed Homeowner's Guide		B
12	11/17	BAD	OK	surface discharge at tank; inlet & outlet tees at same end of tank; inlet below outlet; lid is broken; old outlet plugged with tampon applicators; not clear if tank is watertight	drainfield replaced in 1998; tank & tees need repairs; modify use habits (do not flush tampons or applicators); maintain system according to enclosed Homeowner's Guide		B
13	11/17	OK	OK	spinkler system in yard around drainfield	discontinue use of sprinklers on drainfield; maintain system according to enclosed Homeowner's Guide		B
14	12/8	BAD	OK	tank lid not protected; lid broken; not clear if tank is watertight	replace inlet tee and tank lid; protect system from traffic; maintain system according to enclosed Homeowner's Guide		B

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SITE #	1999 INSP DATE	INLET TEE	OUTL. TEE	NOTE PROBLEMS	REPAIRS NEEDED	ESTIM. REPAIR COST	PRIORITY RANKING
15	12/7	BAD	OK	outlet tee concrete deteriorating; sanitary pads in tank	recheck tee periodically or have integrity of concrete tested by DHEC; replace when needed; maintain system according to enclosed Homeowner's Guide		B
16	12/9	BAD	OK	lid broken; water trickled in from house; drainfield gravel tilled up due to garden, some broken terra cotta pipe visible; irrigation well too close to system	replace lid and inlet tee; discontinue gardening over drainfield; relocate well at least 50 feet from system or properly abandon; maintain system according to enclosed Homeowner's Guide		B
17	12/9	BAD	OK	tank not sealed - LOTS of roots (blocking outlet tee); lid needs repair or replacement; liquid level above outlet tee; liquid flowing in tank from drainfield	eliminate roots; replace inlet tee; check drainfield or replace; maintain system according to enclosed Homeowner's Guide		B
18	12/15	BAD	?	roots in tank massed around inlet tee (flow not obstructed);	try to remove and prevent root infiltration in tank; replace inlet tee & check outlet tee; maintain system according to enclosed Homeowner's Guide		B
19	12/8	BAD	OK	tank is deteriorating at top & is not watertight; inlet tee is busted;	replace inlet tee; determine causes of tank failure (ask for DHEC assistance and fix or replace; maintain system according to enclosed Homeowner's Guide		B

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DATA FROM SCDHEC-OCRM

SITE #	1999 INSP DATE	INLET TEE	OUTL. TEE	NOTE PROBLEMS	REPAIRS NEEDED	ESTIM. REPAIR COST	PRIORITY RANKING
20	12/8	?	OK	old rusty water line runs over top of tank lid, making removal difficult; tank is small and was full; washing machine drains openly under house	relocate water line away from tank; connect washing machine to system (may need bigger tank too); maintain system according to enclosed Homeowner's Guide		B
21	11/17	BAD	OK	tank tilts approximately 5-10 degrees away from drainfield; no inlet tee	install inlet tee; maintain system according to enclosed Homeowner's Guide		B
22	10/26	OK	OK	protective barriers not effective; check for roof gutters directed at system; scum layer on bottom of oulet end lid	put in protective barriers; check gutters so they don't discharge over drainfield; maintain system according to enclosed Homeowner's Guide		C
23	10/27	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
24	10/27	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
25	11/17	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
26	10/27	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
27	10/27	OK	?	no protective barriers - drainfield next to driveway	install protective barriers for drainfield; maintain system according to enclosed Homeowner's Guide		C
28	12/7	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
29	12/8	OK	OK	no protective barriers	install protective barriers to keep vehicles off system; maintain system according to enclosed Homeowner's Guide		C

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DATA FROM SCDHEC-OCRM

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30	12/9	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
31	12/9	OK*	OK	*there are 2 inlet tees & 1 is broken	replace inlet tee if in use; maintain system according to enclosed Homeowner's Guide		C
32	12/9	OK	OK	protective barriers not effective;	protect system from traffic; maintain system according to enclosed Homeowner's Guide		C
33	12/8	OK	OK	addition to house was built over drainfield	drainfield may need relocating in future; maintain system according to enclosed Homeowner's Guide		C
34	12/8	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
35	12/7	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
36	12/9	OK	OK	system in good operational condition	maintain system according to enclosed Homeowner's Guide		C
37	12/15	OK	OK	tank lid exposed but not dangerous; old brick tank is small; may need frequent servicing	maintain system according to enclosed Homeowner's Guide		C
38	12/15	OK	OK	spinkler system in yard around drainfield	discontinue use of sprinklers on drainfield; maintain system according to enclosed Homeowner's Guide		C
39	primary septic tank not accessible	?	?	septic tank was inaccessible due to deck covering; could not be inspected or pumped; drainfield looked okay	septic tank must be made accessible for routine pumping; maintain system according to enclosed Homeowner's Guide		
40	8/10	OK	OK	evidence of traffic over drainfield	install protective barriers for drainfield; maintain system according to enclosed Homeowner's Guide		C

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